F I G. 1

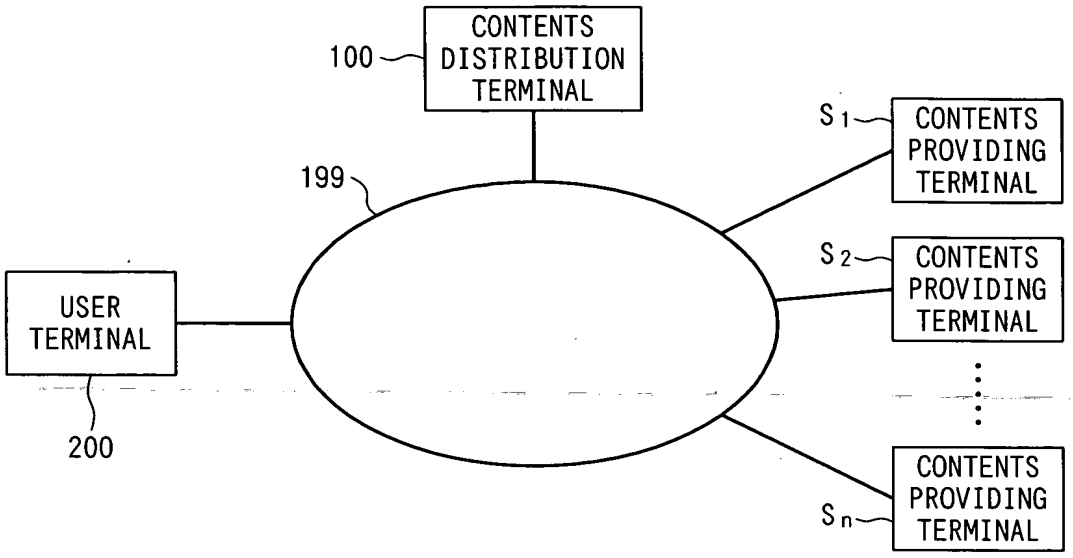
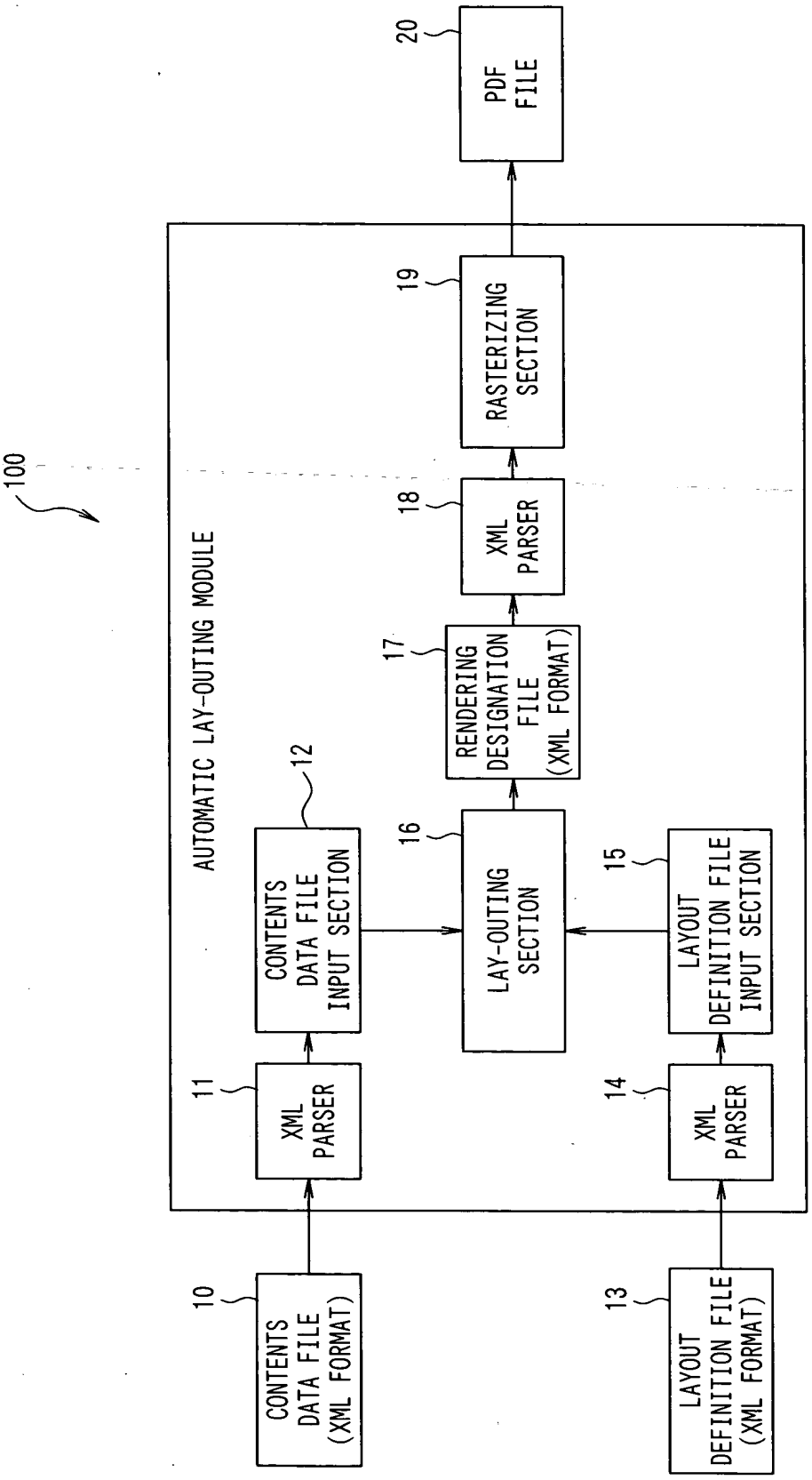

100
CONTENTS DISTRIBUTION TERMINAL
199
USER TERMINAL
200
S 1
CONTENTS PROVIDING TERMINAL
S 2
CONTENTS PROVIDING TERMINAL
S n
CONTENTS PROVIDING TERMINAL

FIG. 2


100
AUTOMATIC LAY-OUTING MODULE
10
CONTENTS DATA FILE (XML FORMAT)
11
XML PARSER
12
CONTENTS DATA FILE INPUT SECTION
13
LAYOUT DEFINITION FILE (XML FORMAT)
14
XML PARSER
15
LAYOUT DEFINITION FILE INPUT SECTION
16
LAY-OUTING SECTION
17
RENDERING DESIGNATION FILE (XML FORMAT)
18
XML PARSER
19
RASTERIZING SECTION
20
PDF FILE

F I G. 3

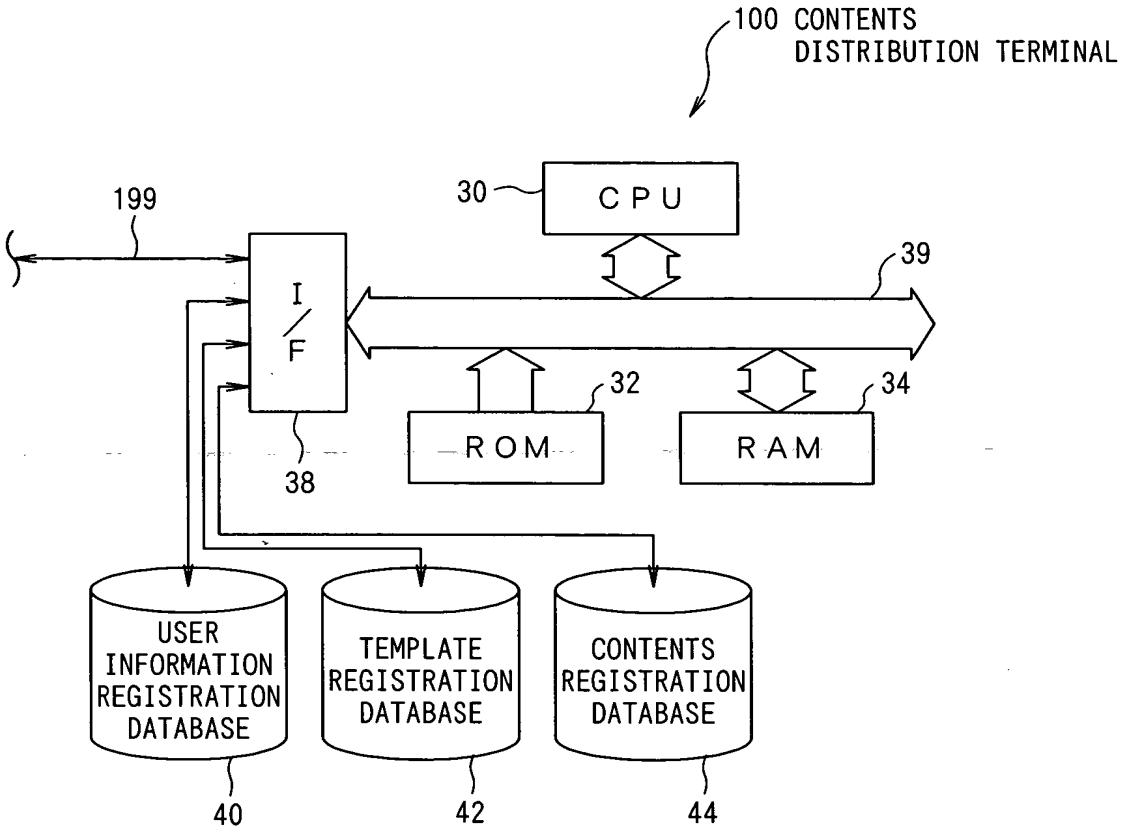

100 CONTENTS DISTRIBUTION TERMINAL
199
30
CPU
39
I/F
32
34
ROM
RAM
38
USER INFORMATION REGISTRATION DATABASE
TEMPLATE REGISTRATION DATABASE
CONTENTS REGISTRATION DATABASE
40
42
44

FIG. 4

300 USER PROFILE TABLE

302 USER ID	304 DISTRIBUTION ADDRESS	306 CATEGORY NO.	308 KEYWORD	310 DISTRIBUTION DATE	312 DISTRIBUTION TIME	314 LAYOUT NO.	316 MAXIMUM PAGE NUMBER	318 FONT SIZE
Andy	Andy@aaa.com	1700	PROCESSOR	DAILY	5	2	2	SMALL
Bill	Bill@bbb.com	1501	OS	WEEKDAY	11	5	2	SMALL
Candy	Candy@ccc.com	201*	APPLICATION	WEEKEND	9	6	u	NORMAL

FIG. 5

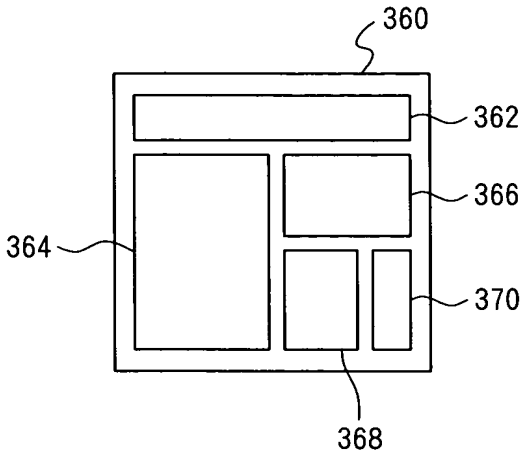


FIG. 6A

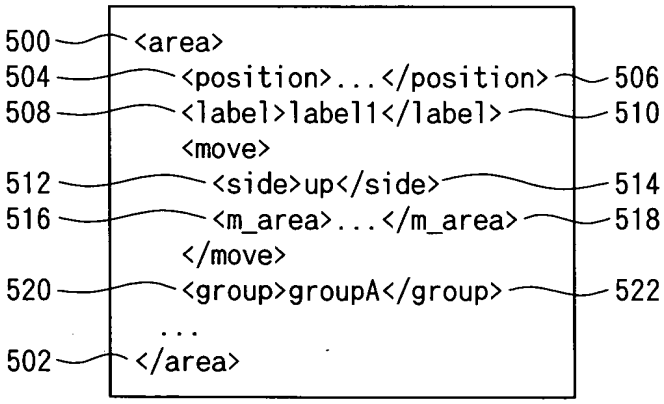


FIG. 6B

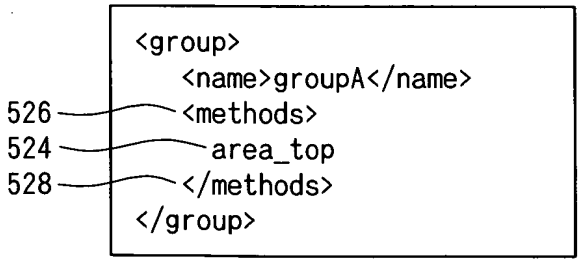


FIG. 7

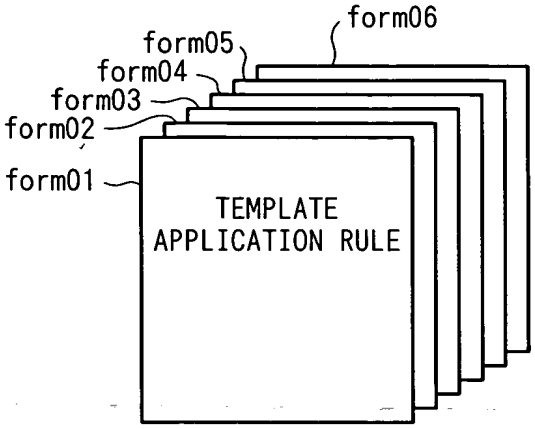


FIG. 8

350 PAGE NO.	352 TEMPLATE NO.
1	1
2	2
3	1
4	2
...	...

FIG. 9

330 LAYOUT NO. CORRESPONDENCE TABLE

332 LAYOUT NO.	334 TEMPLATE APPLICATION RULE
1	form 01
2	form 02
3	form 03
4	form 04
5	form 05
6	form 06

FIG. 10A

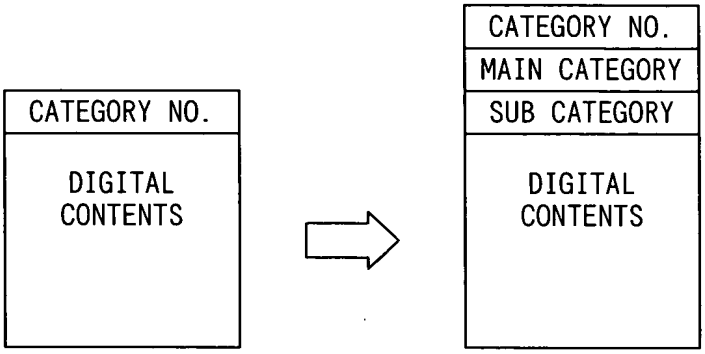


FIG. 10B

340 CATEGORY NO. CORRESPONDENCE TABLE

342 CATEGORY NO.	344 MAIN CATEGORY	346 SUB CATEGORY
1102	WORLD NEWS	US
1135	AREA	TOKYO
1122	POLITICS	ELECTION
1202	WEATHER	WORLD TEMPERATURE
1310	BUSINESS	GENERAL FINANCE
2010	SPORTS	BASEBALL
2020	SPORTS	FOOTBALL
2030	SPORTS	BASKETBALL
2040	SPORTS	HOCKEY
2050	SPORTS	SOCCER
2070	SPORTS	GOLF
3000	SPORTS	TENNIS
1121	HOBBY	HISTORY
1500	HEALTH	PREVENTION
1401	PASTIME	TV
1432	TRAVEL	SIGHTSEEING TRIP
1501	SCIENCE&TECHNOLOGY	COMPUTER

FIG. 11

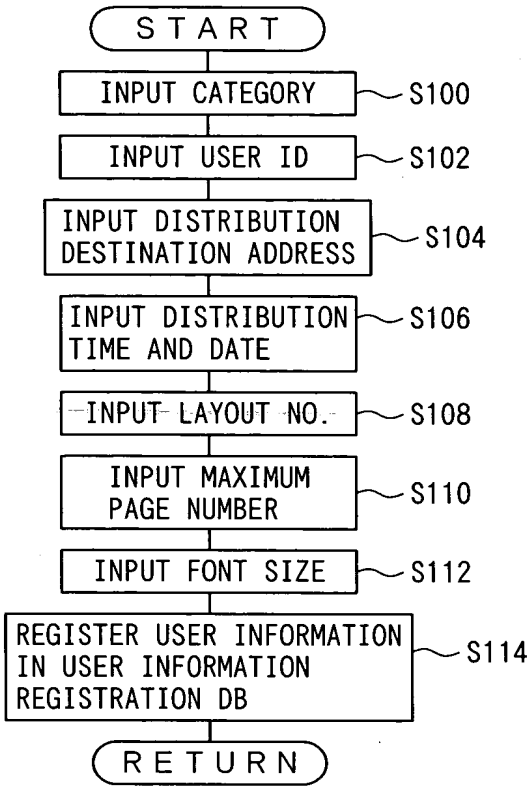

START
INPUT CATEGORY
S100
INPUT USER ID
S102
INPUT DISTRIBUTION DESTINATION ADDRESS
S104
INPUT DISTRIBUTION TIME AND DATE
S106
INPUT LAYOUT NO.
S108
INPUT MAXIMUM PAGE NUMBER
S110
INPUT FONT SIZE
S112
REGISTER USER INFORMATION IN USER INFORMATION REGISTRATION DB
S114
RETURN

FIG. 12

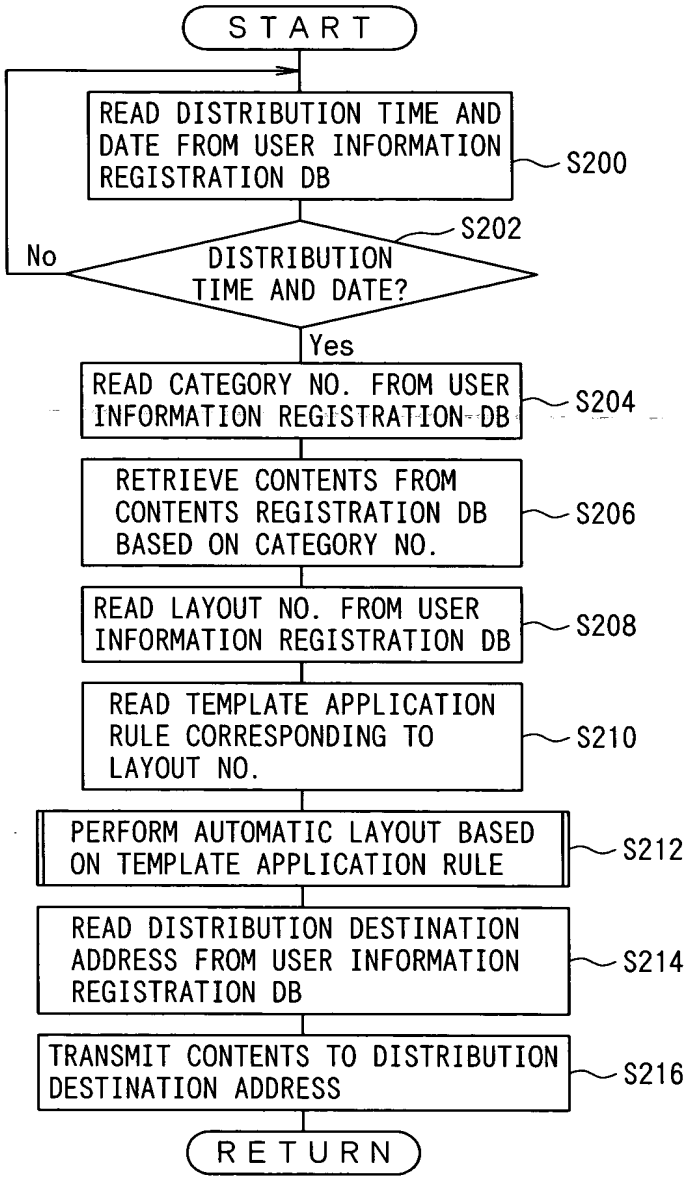

START
READ DISTRIBUTION TIME AND DATE FROM USER INFORMATION REGISTRATION DB
S200
S202
No
DISTRIBUTION TIME AND DATE?
Yes
READ CATEGORY NO. FROM USER INFORMATION REGISTRATION DB
S204
RETRIEVE CONTENTS FROM CONTENTS REGISTRATION DB BASED ON CATEGORY NO.
S206
READ LAYOUT NO. FROM USER INFORMATION REGISTRATION DB
S208
READ TEMPLATE APPLICATION RULE CORRESPONDING TO LAYOUT NO.
S210
PERFORM AUTOMATIC LAYOUT BASED ON TEMPLATE APPLICATION RULE
S212
READ DISTRIBUTION DESTINATION ADDRESS FROM USER INFORMATION REGISTRATION DB
S214
TRANSMIT CONTENTS TO DISTRIBUTION DESTINATION ADDRESS
S216
RETURN

FIG. 13

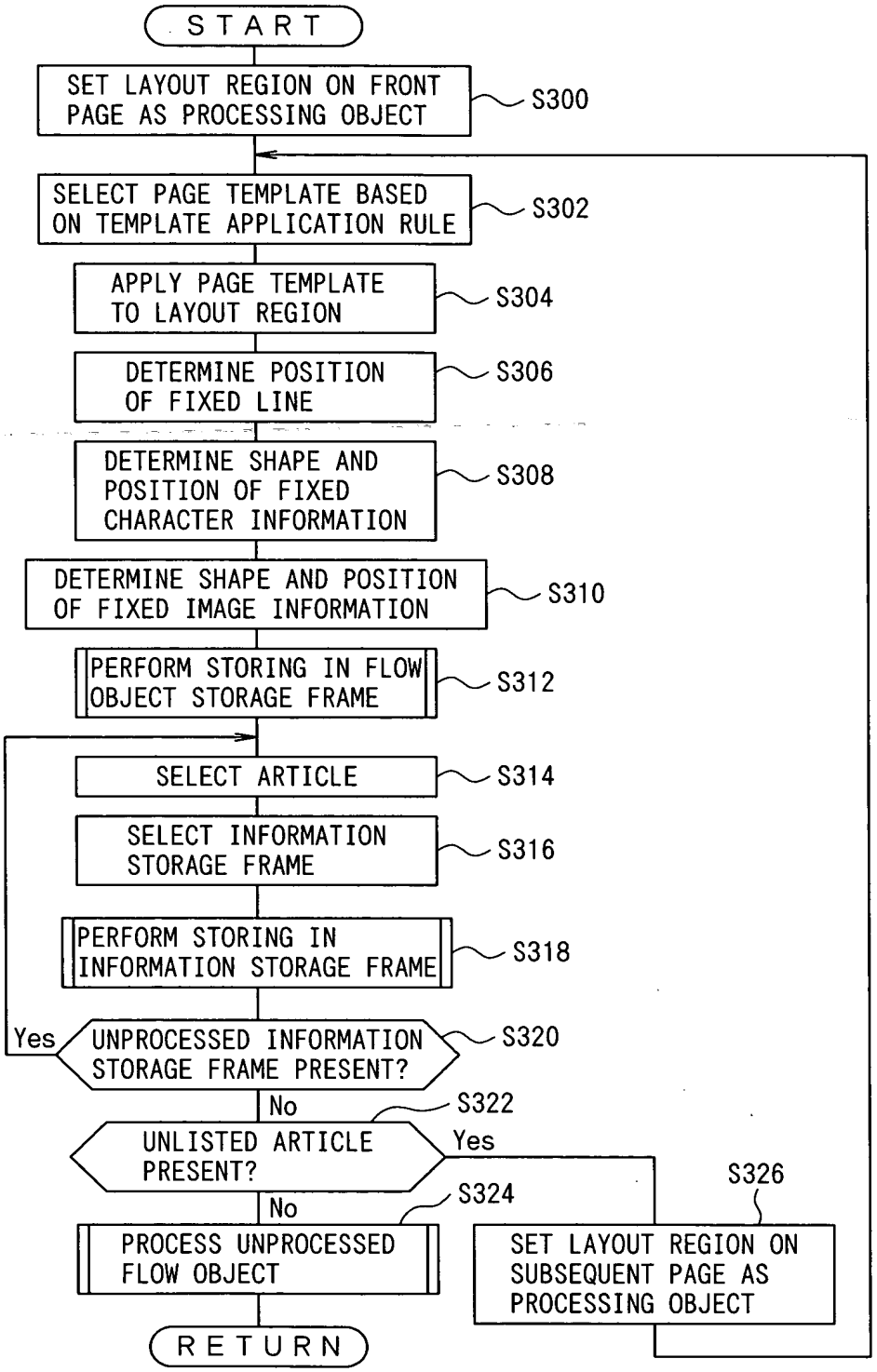

START
SET LAYOUT REGION ON FRONT PAGE AS PROCESSING OBJECT
S300
SELECT PAGE TEMPLATE BASED ON TEMPLATE APPLICATION RULE
S302
APPLY PAGE TEMPLATE TO LAYOUT REGION
S304
DETERMINE POSITION OF FIXED LINE
S306
DETERMINE SHAPE AND POSITION OF FIXED CHARACTER INFORMATION
S308
DETERMINE SHAPE AND POSITION OF FIXED IMAGE INFORMATION
S310
PERFORM STORING IN FLOW OBJECT STORAGE FRAME
S312
SELECT ARTICLE
S314
SELECT INFORMATION STORAGE FRAME
S316
PERFORM STORING IN INFORMATION STORAGE FRAME
S318
Yes
UNPROCESSED INFORMATION STORAGE FRAME PRESENT?
S320
No
S322
UNLISTED ARTICLE PRESENT?
Yes
S326
No
S324
PROCESS UNPROCESSED FLOW OBJECT
SET LAYOUT REGION ON SUBSEQUENT PAGE AS PROCESSING OBJECT
RETURN

FIG. 14

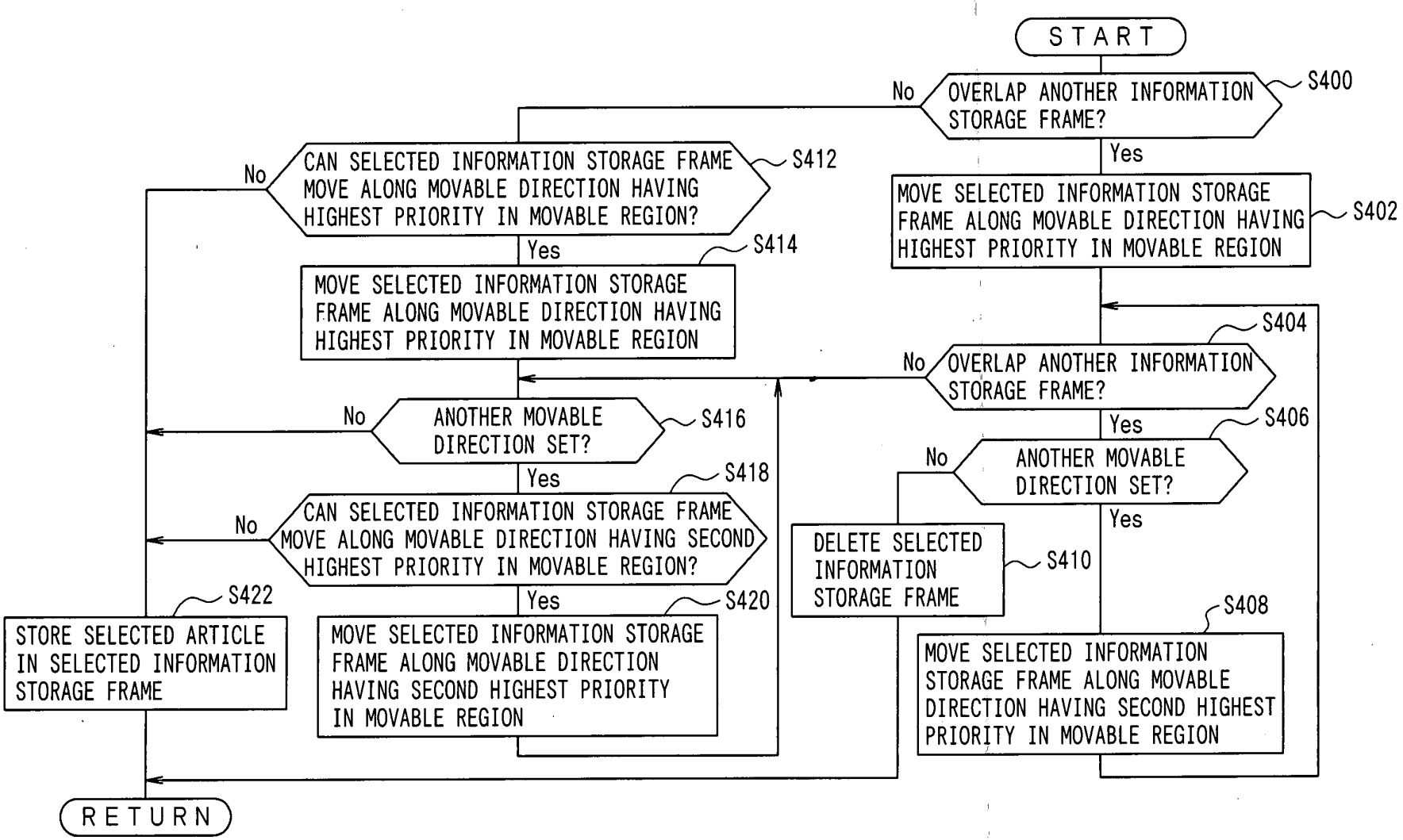

START
OVERLAP ANOTHER INFORMATION STORAGE FRAME?
S400
No
Yes
MOVE SELECTED INFORMATION STORAGE FRAME ALONG MOVABLE DIRECTION HAVING HIGHEST PRIORITY IN MOVABLE REGION
S402
OVERLAP ANOTHER INFORMATION STORAGE FRAME?
S404
No
Yes
ANOTHER MOVABLE DIRECTION SET?
S406
No
Yes
DELETE SELECTED INFORMATION STORAGE FRAME
S410
MOVE SELECTED INFORMATION STORAGE FRAME ALONG MOVABLE DIRECTION HAVING SECOND HIGHEST PRIORITY IN MOVABLE REGION
S408
CAN SELECTED INFORMATION STORAGE FRAME MOVE ALONG MOVABLE DIRECTION HAVING HIGHEST PRIORITY IN MOVABLE REGION?
S412
No
Yes
MOVE SELECTED INFORMATION STORAGE FRAME ALONG MOVABLE DIRECTION HAVING HIGHEST PRIORITY IN MOVABLE REGION
S414
ANOTHER MOVABLE DIRECTION SET?
S416
No
Yes
CAN SELECTED INFORMATION STORAGE FRAME MOVE ALONG MOVABLE DIRECTION HAVING SECOND HIGHEST PRIORITY IN MOVABLE REGION?
S418
No
Yes
MOVE SELECTED INFORMATION STORAGE FRAME ALONG MOVABLE DIRECTION HAVING SECOND HIGHEST PRIORITY IN MOVABLE REGION
S420
STORE SELECTED ARTICLE IN SELECTED INFORMATION STORAGE FRAME
S422
RETURN

FIG. 15A

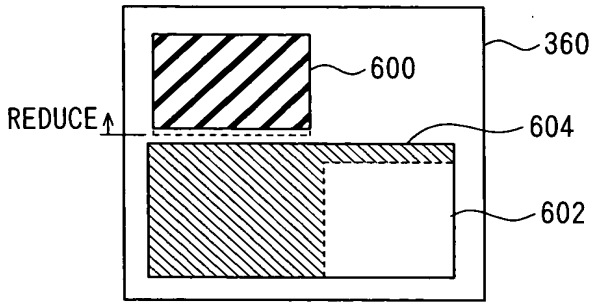


FIG. 15B

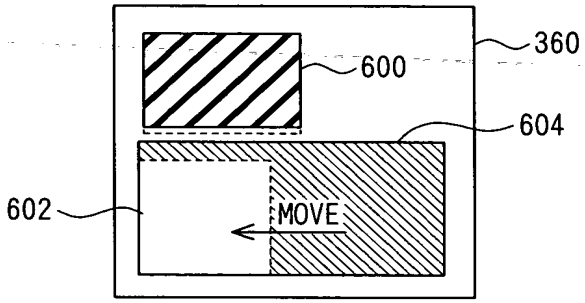


FIG. 15C

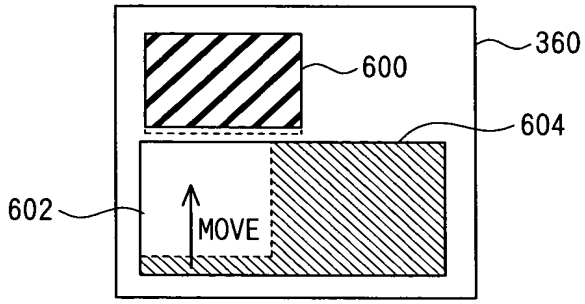


FIG. 15D

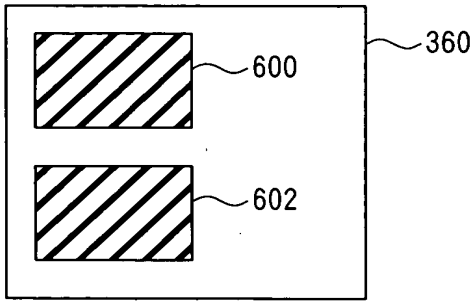


FIG. 16

```
500 ~ <area>
    504 ~ <position>...</position> ~ 506
    508 ~ <label>label2</label> ~ 510
          <move>
      512 ~ <side>left</side> ~ 514
      512 ~ <side>up</side> ~ 514
      516 ~ <m_area>...</m_area> ~ 518
          </move>
          <move>
      520 ~ <side>down</side> ~ 522
      524 ~ <m_area>...</m_area> ~ 526
      528 ~ <start>...</start> ~ 530
          </move>
          ...
502 ~ </area>
```

FIG. 17

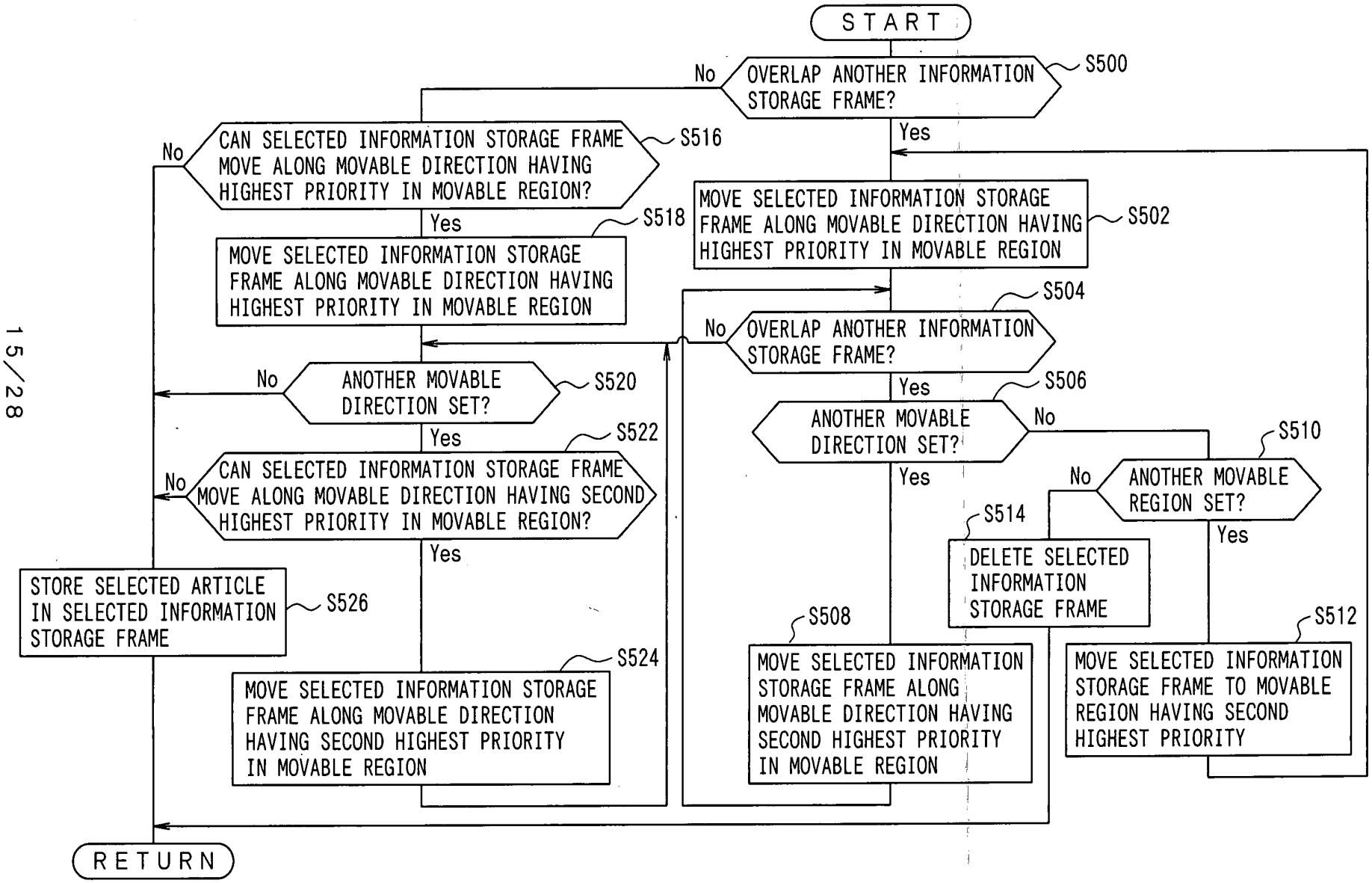

START
OVERLAP ANOTHER INFORMATION STORAGE FRAME?
S500
No
Yes
MOVE SELECTED INFORMATION STORAGE FRAME ALONG MOVABLE DIRECTION HAVING HIGHEST PRIORITY IN MOVABLE REGION
S502
OVERLAP ANOTHER INFORMATION STORAGE FRAME?
S504
No
Yes
ANOTHER MOVABLE DIRECTION SET?
S506
No
Yes
ANOTHER MOVABLE REGION SET?
S510
No
Yes
DELETE SELECTED INFORMATION STORAGE FRAME
S514
MOVE SELECTED INFORMATION STORAGE FRAME ALONG MOVABLE DIRECTION HAVING SECOND HIGHEST PRIORITY IN MOVABLE REGION
S508
MOVE SELECTED INFORMATION STORAGE FRAME TO MOVABLE REGION HAVING SECOND HIGHEST PRIORITY
S512
CAN SELECTED INFORMATION STORAGE FRAME MOVE ALONG MOVABLE DIRECTION HAVING HIGHEST PRIORITY IN MOVABLE REGION?
S516
No
Yes
MOVE SELECTED INFORMATION STORAGE FRAME ALONG MOVABLE DIRECTION HAVING HIGHEST PRIORITY IN MOVABLE REGION
S518
ANOTHER MOVABLE DIRECTION SET?
S520
No
Yes
CAN SELECTED INFORMATION STORAGE FRAME MOVE ALONG MOVABLE DIRECTION HAVING SECOND HIGHEST PRIORITY IN MOVABLE REGION?
S522
No
Yes
MOVE SELECTED INFORMATION STORAGE FRAME ALONG MOVABLE DIRECTION HAVING SECOND HIGHEST PRIORITY IN MOVABLE REGION
S524
STORE SELECTED ARTICLE IN SELECTED INFORMATION STORAGE FRAME
S526
RETURN

FIG. 18A

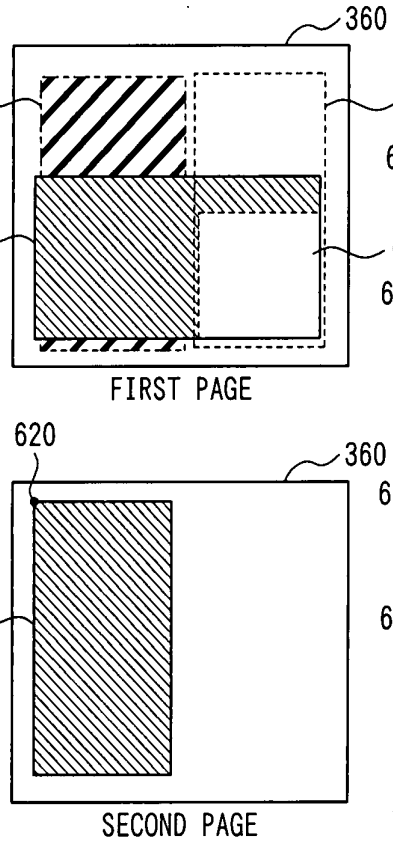


FIG. 18B

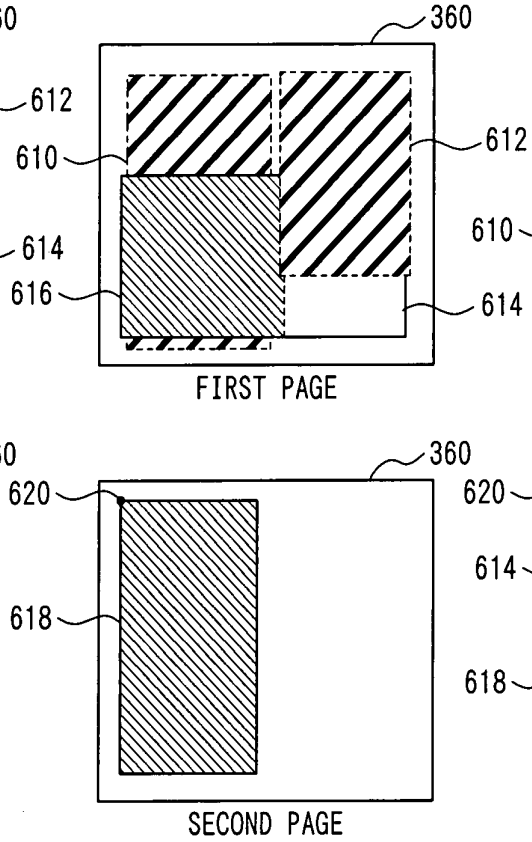


FIG. 18C

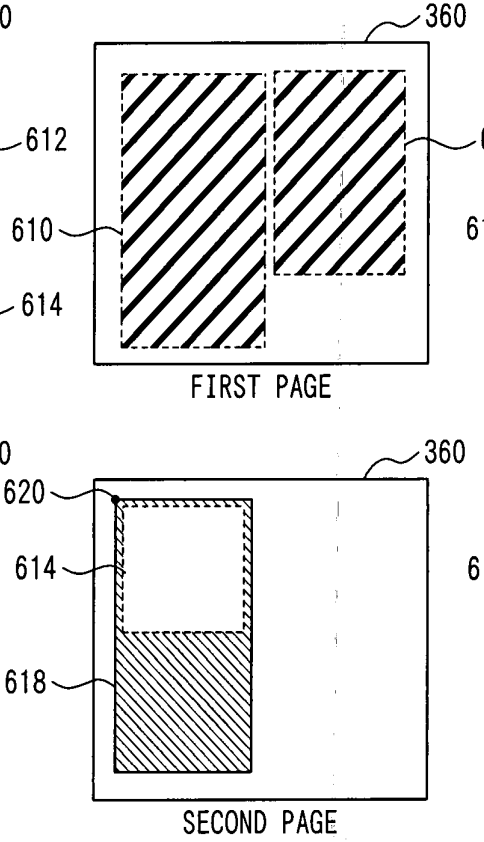


FIG. 18D

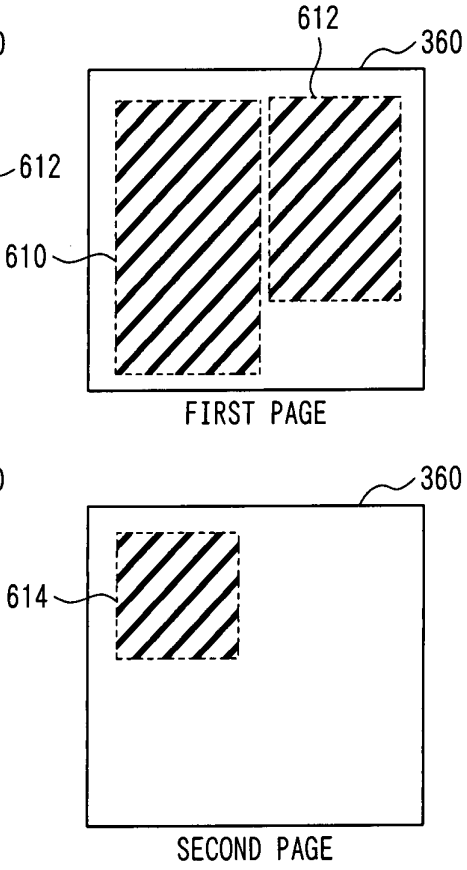


FIG. 19

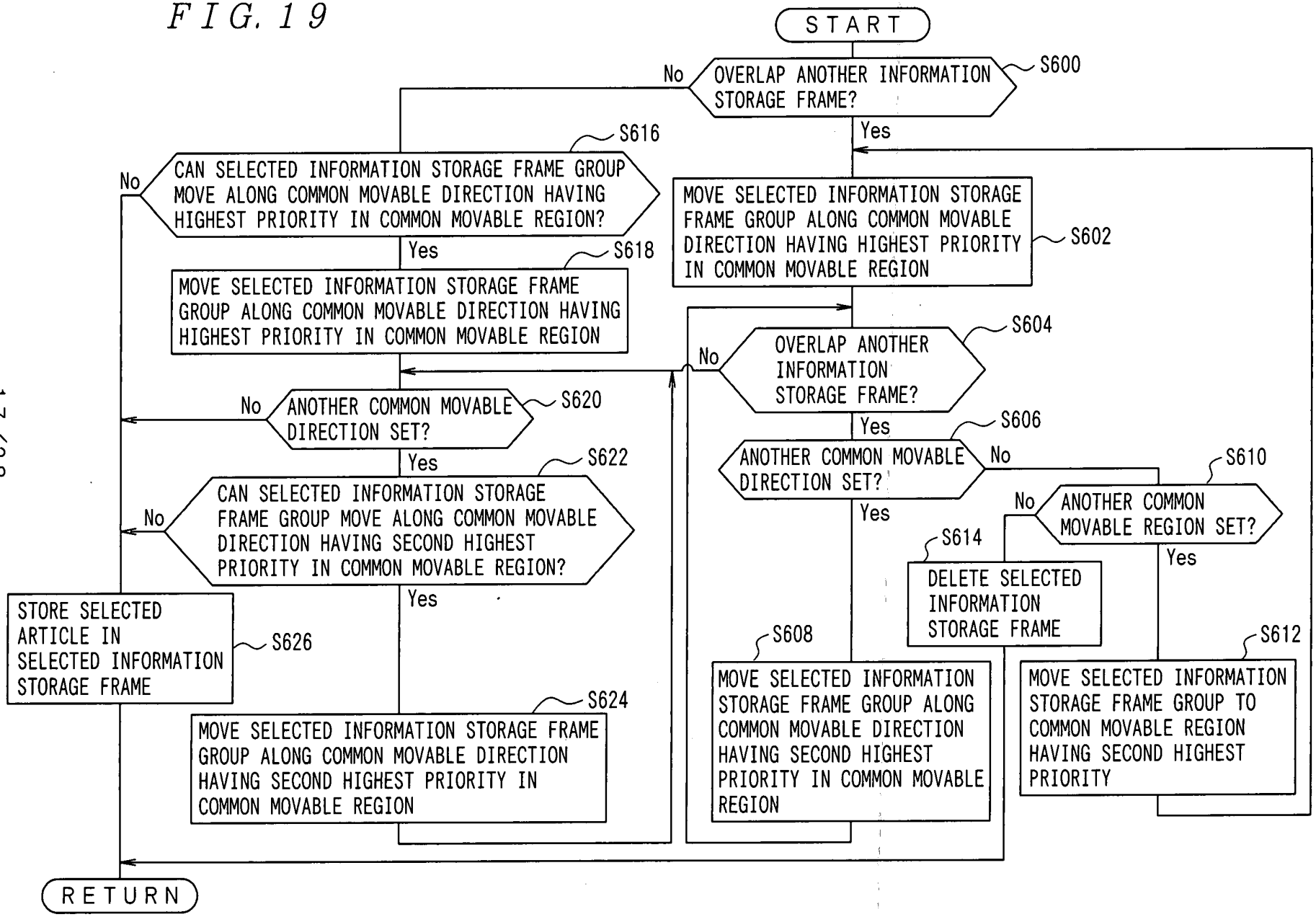

START
OVERLAP ANOTHER INFORMATION STORAGE FRAME?
S600
No
Yes
MOVE SELECTED INFORMATION STORAGE FRAME GROUP ALONG COMMON MOVABLE DIRECTION HAVING HIGHEST PRIORITY IN COMMON MOVABLE REGION
S602
OVERLAP ANOTHER INFORMATION STORAGE FRAME?
S604
No
Yes
ANOTHER COMMON MOVABLE DIRECTION SET?
S606
No
Yes
ANOTHER COMMON MOVABLE REGION SET?
S610
No
Yes
DELETE SELECTED INFORMATION STORAGE FRAME
S614
MOVE SELECTED INFORMATION STORAGE FRAME GROUP ALONG COMMON MOVABLE DIRECTION HAVING SECOND HIGHEST PRIORITY IN COMMON MOVABLE REGION
S608
MOVE SELECTED INFORMATION STORAGE FRAME GROUP TO COMMON MOVABLE REGION HAVING SECOND HIGHEST PRIORITY
S612
CAN SELECTED INFORMATION STORAGE FRAME GROUP MOVE ALONG COMMON MOVABLE DIRECTION HAVING HIGHEST PRIORITY IN COMMON MOVABLE REGION?
S616
No
Yes
MOVE SELECTED INFORMATION STORAGE FRAME GROUP ALONG COMMON MOVABLE DIRECTION HAVING HIGHEST PRIORITY IN COMMON MOVABLE REGION
S618
ANOTHER COMMON MOVABLE DIRECTION SET?
S620
No
Yes
CAN SELECTED INFORMATION STORAGE FRAME GROUP MOVE ALONG COMMON MOVABLE DIRECTION HAVING SECOND HIGHEST PRIORITY IN COMMON MOVABLE REGION?
S622
No
Yes
STORE SELECTED ARTICLE IN SELECTED INFORMATION STORAGE FRAME
S626
MOVE SELECTED INFORMATION STORAGE FRAME GROUP ALONG COMMON MOVABLE DIRECTION HAVING SECOND HIGHEST PRIORITY IN COMMON MOVABLE REGION
S624
RETURN

FIG. 20A

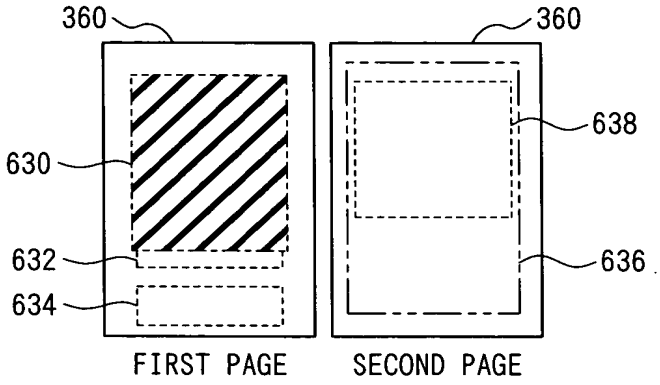


FIG. 20B

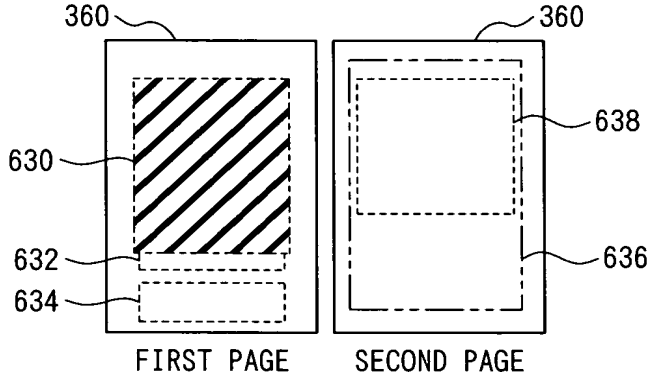


FIG. 20C

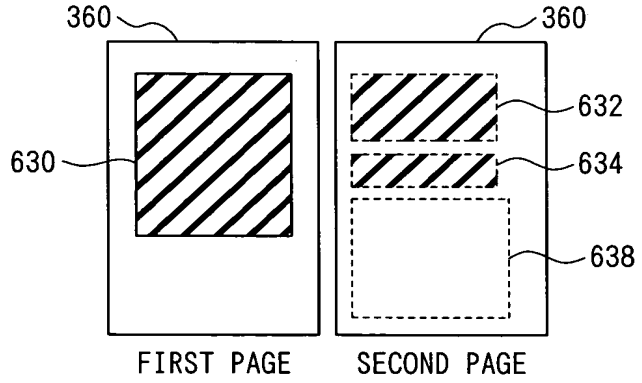


FIG. 21

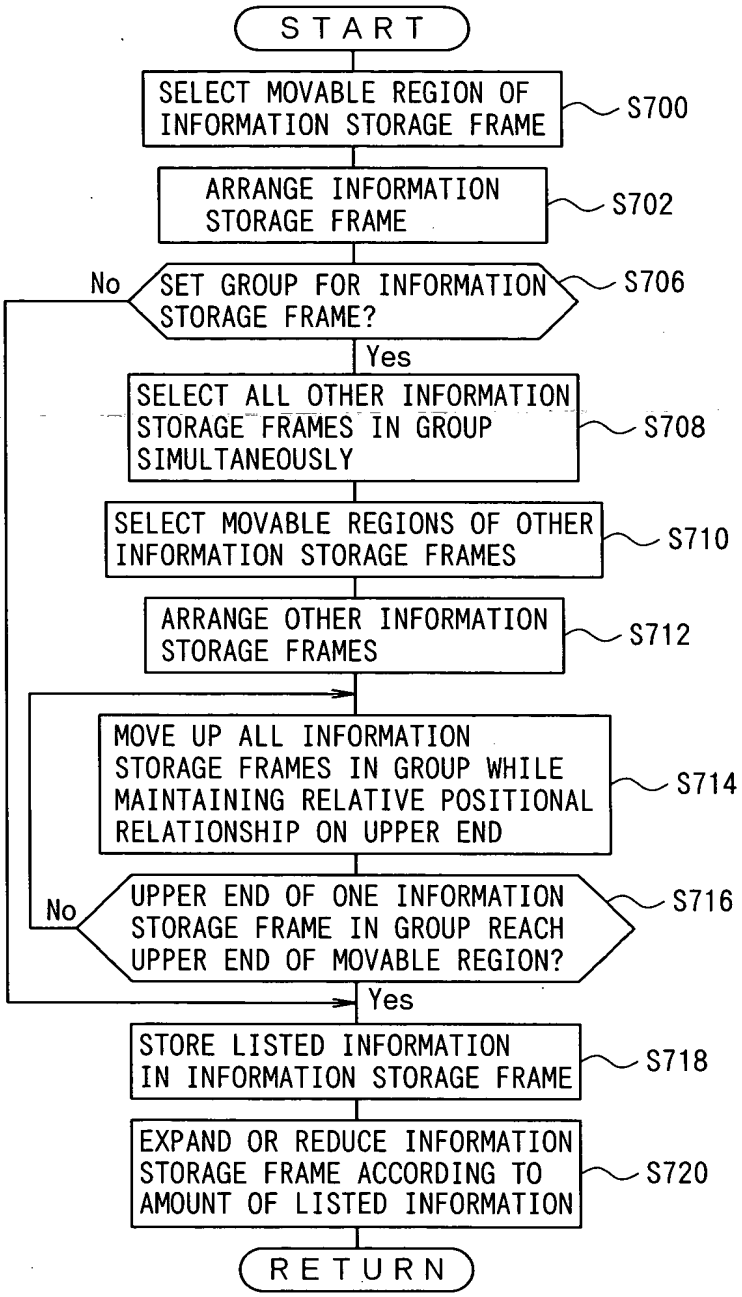

START
SELECT MOVABLE REGION OF INFORMATION STORAGE FRAME
S700
ARRANGE INFORMATION STORAGE FRAME
S702
No
SET GROUP FOR INFORMATION STORAGE FRAME?
S706
Yes
SELECT ALL OTHER INFORMATION STORAGE FRAMES IN GROUP SIMULTANEOUSLY
S708
SELECT MOVABLE REGIONS OF OTHER INFORMATION STORAGE FRAMES
S710
ARRANGE OTHER INFORMATION STORAGE FRAMES
S712
MOVE UP ALL INFORMATION STORAGE FRAMES IN GROUP WHILE MAINTAINING RELATIVE POSITIONAL RELATIONSHIP ON UPPER END
S714
No
UPPER END OF ONE INFORMATION STORAGE FRAME IN GROUP REACH UPPER END OF MOVABLE REGION?
S716
Yes
STORE LISTED INFORMATION IN INFORMATION STORAGE FRAME
S718
EXPAND OR REDUCE INFORMATION STORAGE FRAME ACCORDING TO AMOUNT OF LISTED INFORMATION
S720
RETURN

FIG. 22A

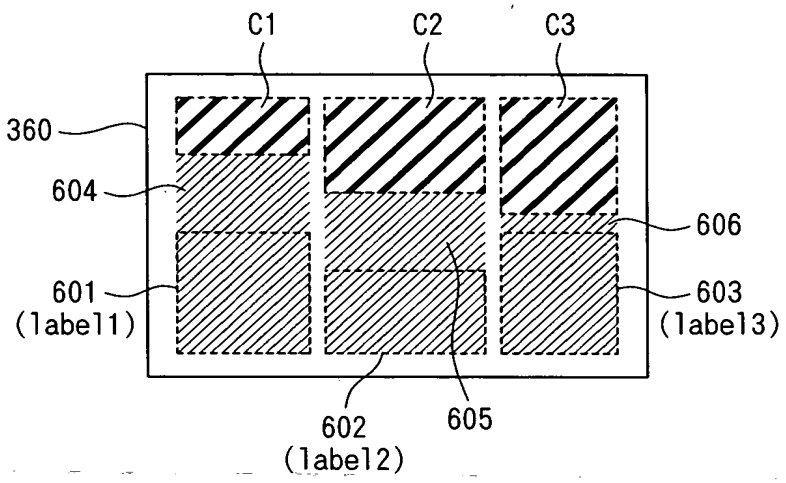


FIG. 22B

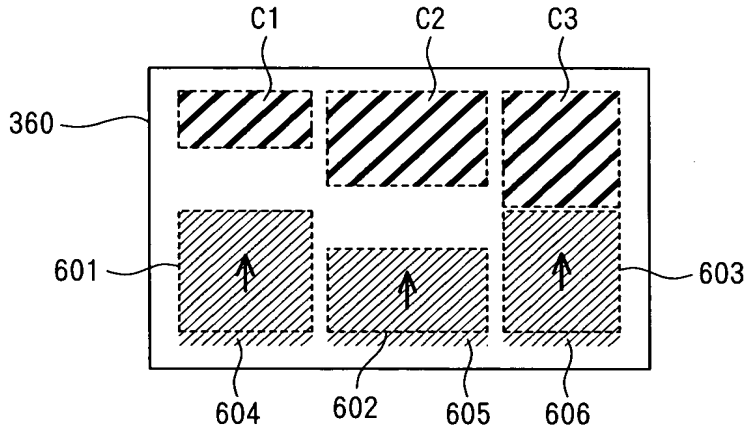


FIG. 22C

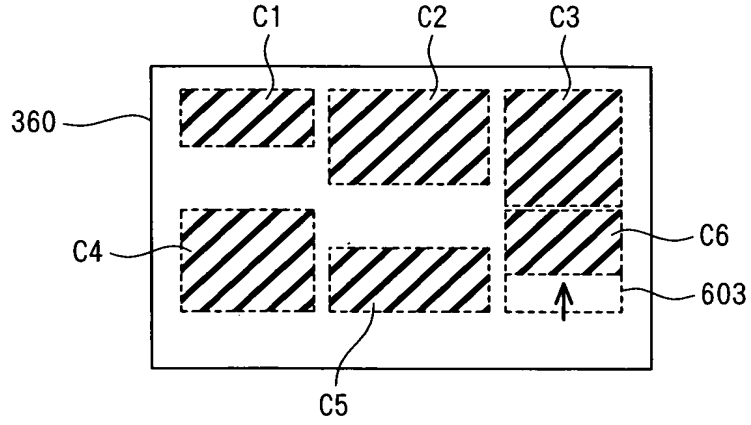


FIG. 23

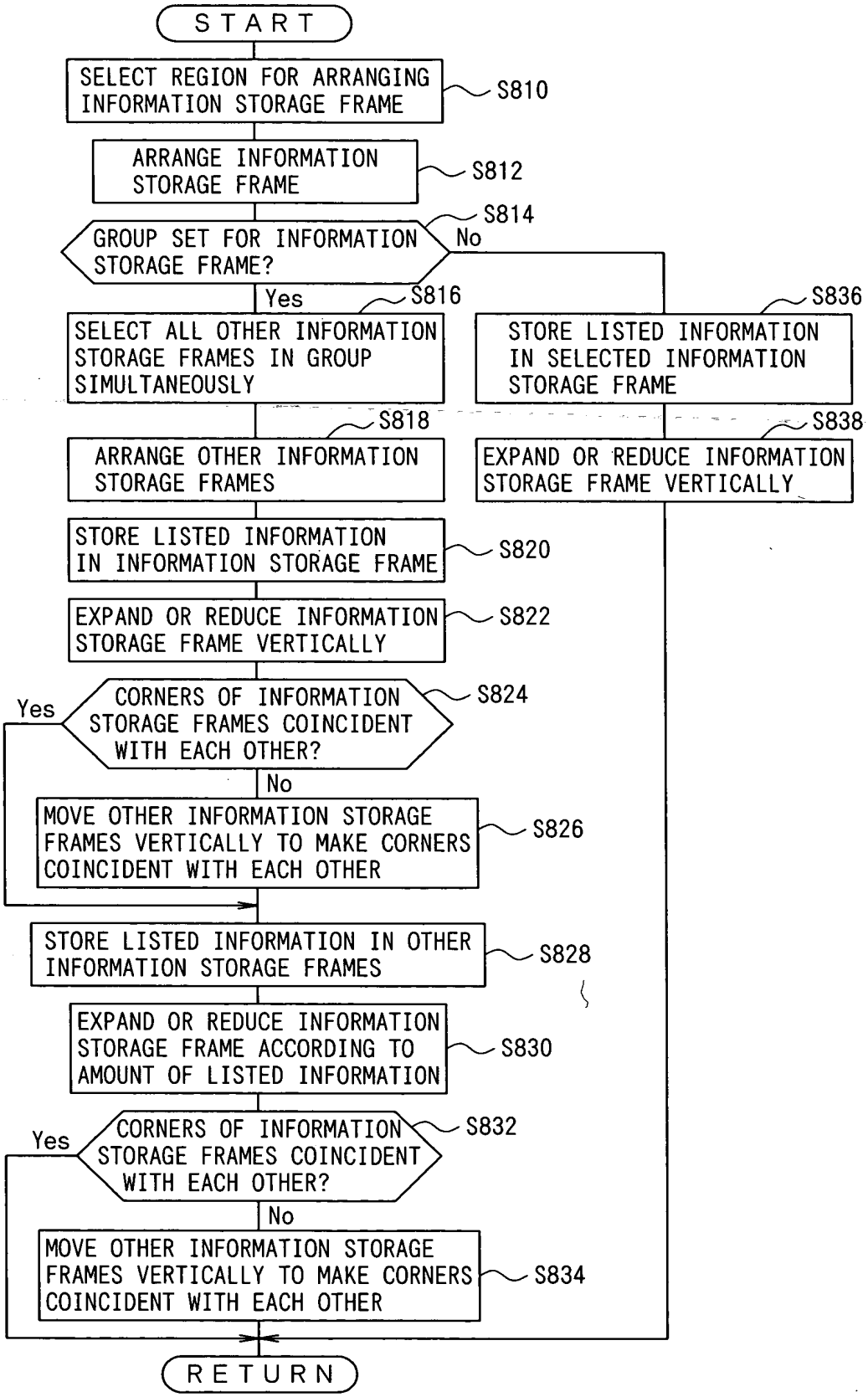

START
SELECT REGION FOR ARRANGING INFORMATION STORAGE FRAME
S810
ARRANGE INFORMATION STORAGE FRAME
S812
S814
GROUP SET FOR INFORMATION STORAGE FRAME?
No
Yes
S816
SELECT ALL OTHER INFORMATION STORAGE FRAMES IN GROUP SIMULTANEOUSLY
S818
ARRANGE OTHER INFORMATION STORAGE FRAMES
S836
STORE LISTED INFORMATION IN SELECTED INFORMATION STORAGE FRAME
S838
EXPAND OR REDUCE INFORMATION STORAGE FRAME VERTICALLY
STORE LISTED INFORMATION IN INFORMATION STORAGE FRAME
S820
EXPAND OR REDUCE INFORMATION STORAGE FRAME VERTICALLY
S822
CORNERS OF INFORMATION STORAGE FRAMES COINCIDENT WITH EACH OTHER?
S824
Yes
No
MOVE OTHER INFORMATION STORAGE FRAMES VERTICALLY TO MAKE CORNERS COINCIDENT WITH EACH OTHER
S826
STORE LISTED INFORMATION IN OTHER INFORMATION STORAGE FRAMES
S828
EXPAND OR REDUCE INFORMATION STORAGE FRAME ACCORDING TO AMOUNT OF LISTED INFORMATION
S830
CORNERS OF INFORMATION STORAGE FRAMES COINCIDENT WITH EACH OTHER?
S832
Yes
No
MOVE OTHER INFORMATION STORAGE FRAMES VERTICALLY TO MAKE CORNERS COINCIDENT WITH EACH OTHER
S834
RETURN

FIG. 24

```
<group>
   <name>groupA</name>
   <methods> area_corner </methods>
   <target>
      <from>
         <label>label1</label>
         <side>upper_left</side>
      </from>
      <to>
         <label>label2</label>
         <side>lower_right</side>
      </to>
   </target>
   <target> ... </target>
</group>
```

FIG. 25

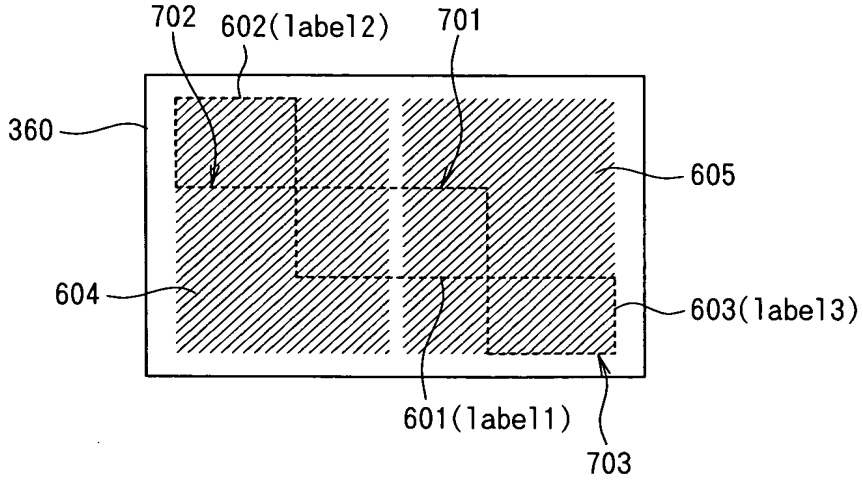


FIG. 26A

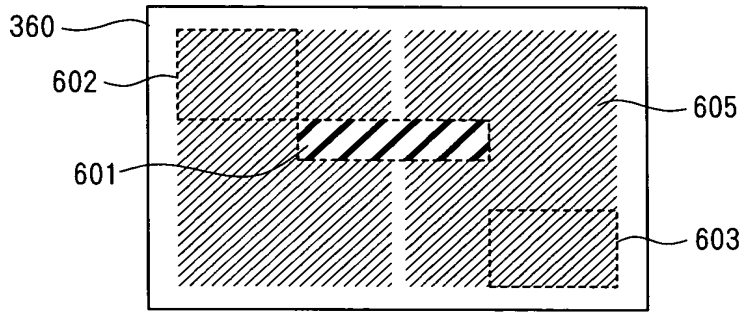


FIG. 26B

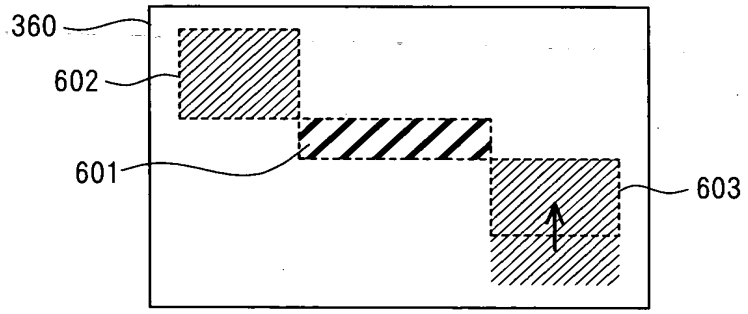


FIG. 26C

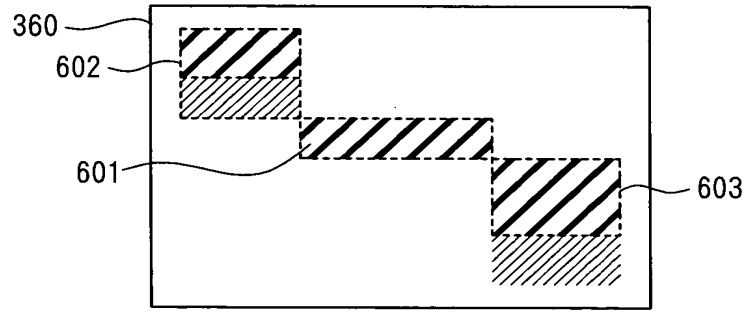


FIG. 26D

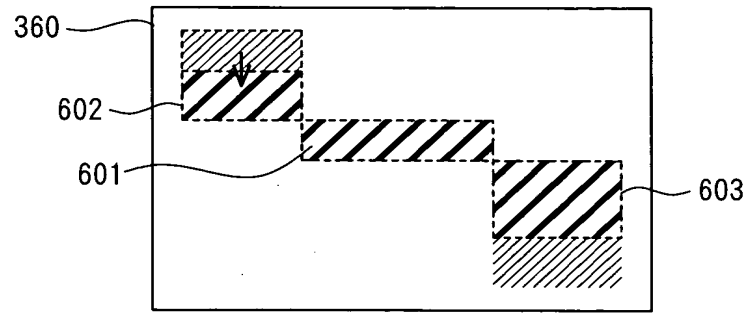


FIG. 27

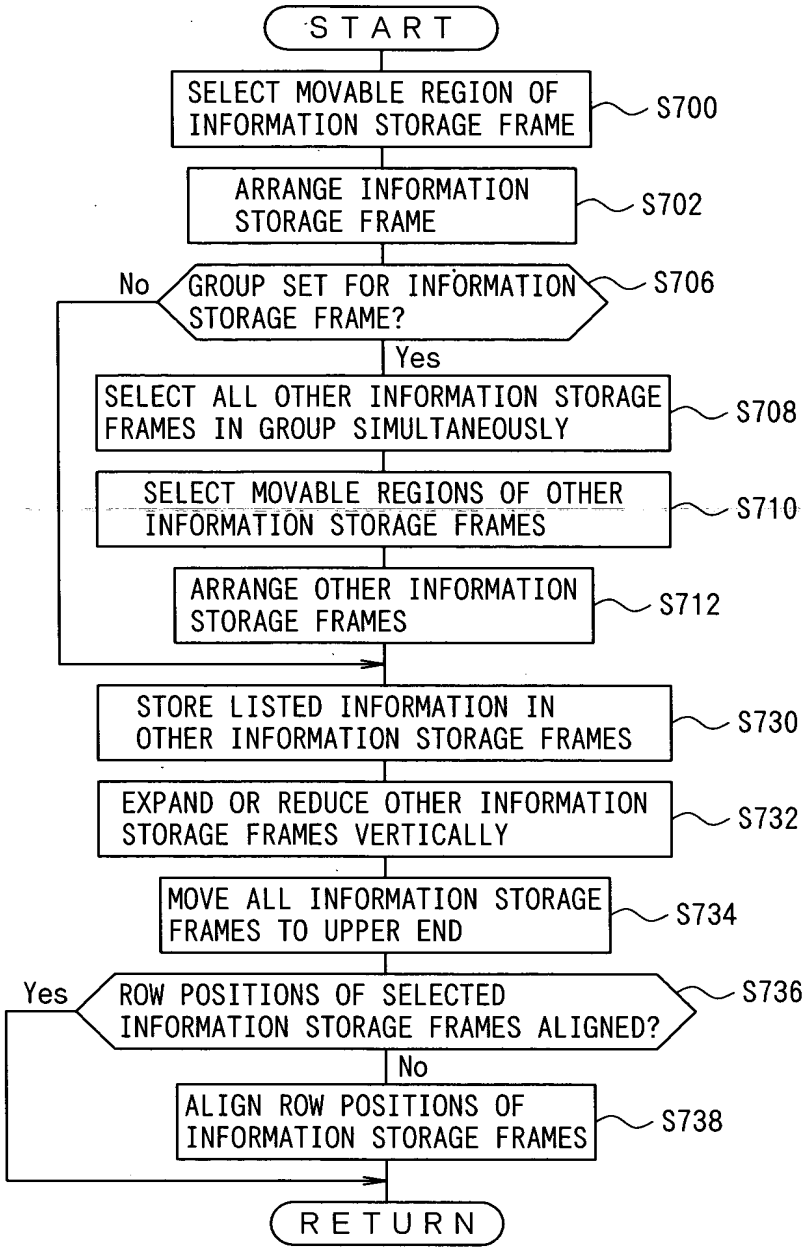


FIG. 28

```
<group>
   <name>groupA</name>
   <methods>
     line
   </methods>
</group>
```

FIG. 29A

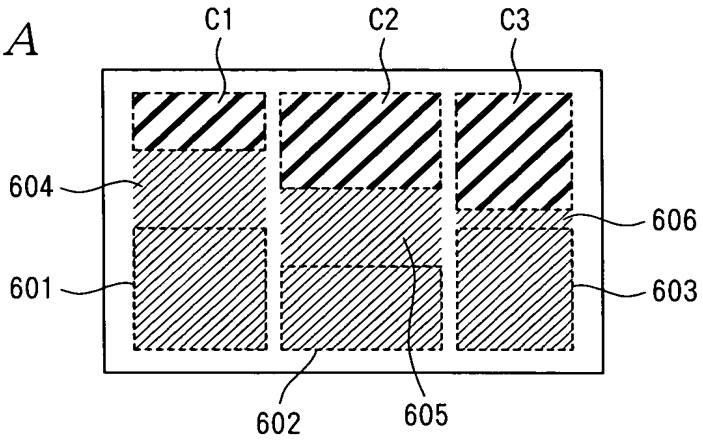


FIG. 29B

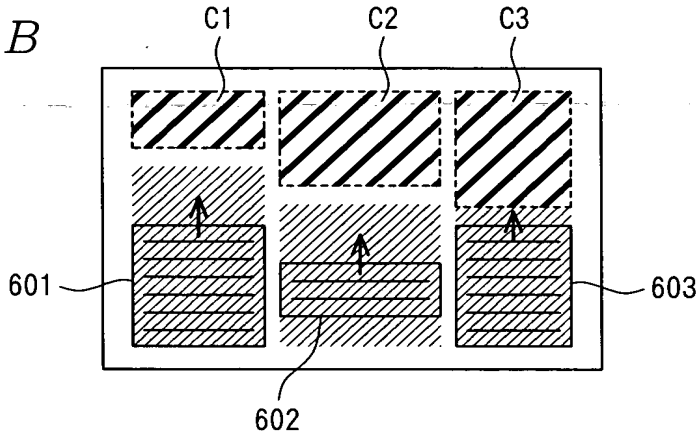


FIG. 29C

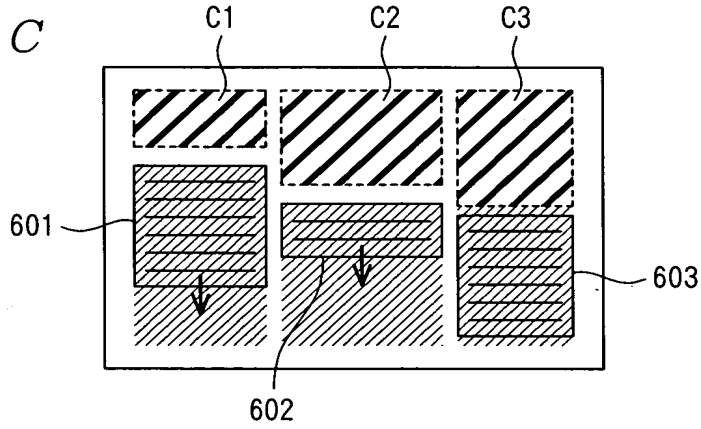


FIG. 30

```
<group>
   <name>groupA</name>
   <methods> line </methods>
   <methods> area_bottom </methods>
</group>
```

FIG. 31

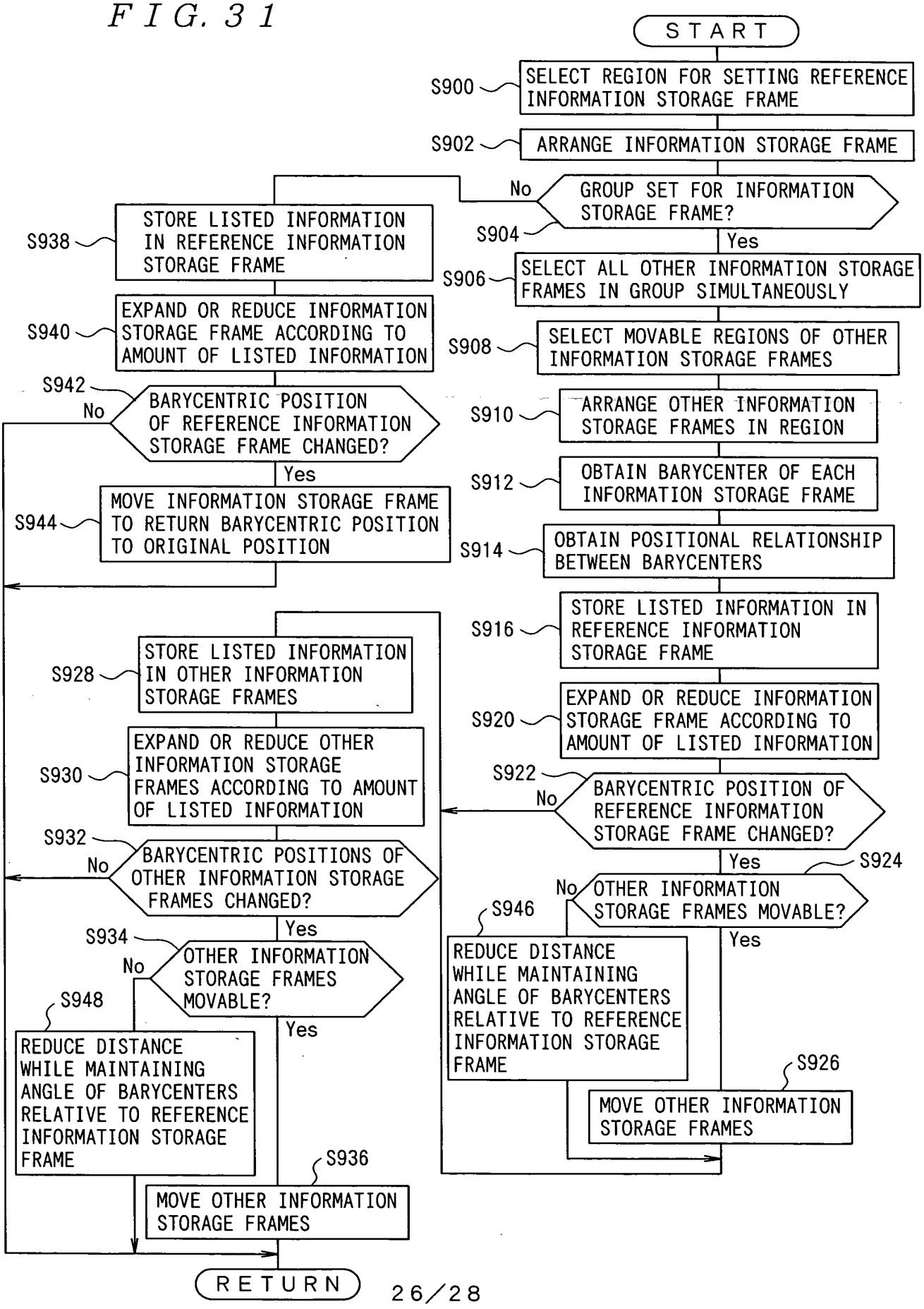

START
S900
SELECT REGION FOR SETTING REFERENCE INFORMATION STORAGE FRAME
S902
ARRANGE INFORMATION STORAGE FRAME
S904
GROUP SET FOR INFORMATION STORAGE FRAME?
No
Yes
S906
SELECT ALL OTHER INFORMATION STORAGE FRAMES IN GROUP SIMULTANEOUSLY
S908
SELECT MOVABLE REGIONS OF OTHER INFORMATION STORAGE FRAMES
S910
ARRANGE OTHER INFORMATION STORAGE FRAMES IN REGION
S912
OBTAIN BARYCENTER OF EACH INFORMATION STORAGE FRAME
S914
OBTAIN POSITIONAL RELATIONSHIP BETWEEN BARYCENTERS
S916
STORE LISTED INFORMATION IN REFERENCE INFORMATION STORAGE FRAME
S920
EXPAND OR REDUCE INFORMATION STORAGE FRAME ACCORDING TO AMOUNT OF LISTED INFORMATION
S922
BARYCENTRIC POSITION OF REFERENCE INFORMATION STORAGE FRAME CHANGED?
No
Yes
S924
OTHER INFORMATION STORAGE FRAMES MOVABLE?
No
Yes
S926
MOVE OTHER INFORMATION STORAGE FRAMES
S946
REDUCE DISTANCE WHILE MAINTAINING ANGLE OF BARYCENTERS RELATIVE TO REFERENCE INFORMATION STORAGE FRAME
S938
STORE LISTED INFORMATION IN REFERENCE INFORMATION STORAGE FRAME
S940
EXPAND OR REDUCE INFORMATION STORAGE FRAME ACCORDING TO AMOUNT OF LISTED INFORMATION
S942
BARYCENTRIC POSITION OF REFERENCE INFORMATION STORAGE FRAME CHANGED?
No
Yes
S944
MOVE INFORMATION STORAGE FRAME TO RETURN BARYCENTRIC POSITION TO ORIGINAL POSITION
S928
STORE LISTED INFORMATION IN OTHER INFORMATION STORAGE FRAMES
S930
EXPAND OR REDUCE OTHER INFORMATION STORAGE FRAMES ACCORDING TO AMOUNT OF LISTED INFORMATION
S932
BARYCENTRIC POSITIONS OF OTHER INFORMATION STORAGE FRAMES CHANGED?
No
Yes
S934
OTHER INFORMATION STORAGE FRAMES MOVABLE?
No
Yes
S948
REDUCE DISTANCE WHILE MAINTAINING ANGLE OF BARYCENTERS RELATIVE TO REFERENCE INFORMATION STORAGE FRAME
S936
MOVE OTHER INFORMATION STORAGE FRAMES
RETURN

FIG. 32

```
<group>
   <name>groupA</name>
   <methods> area_center</methods>
</group>
```

FIG. 33A

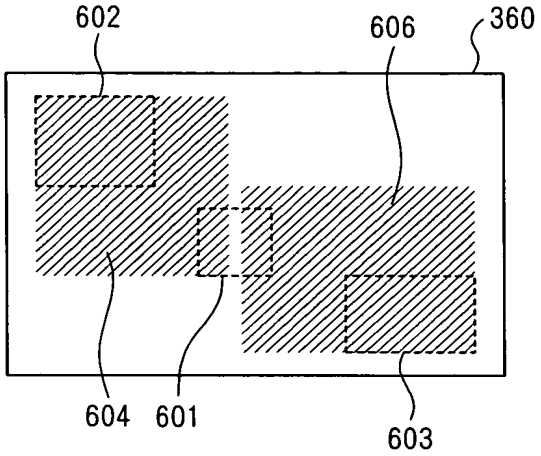


FIG. 33D

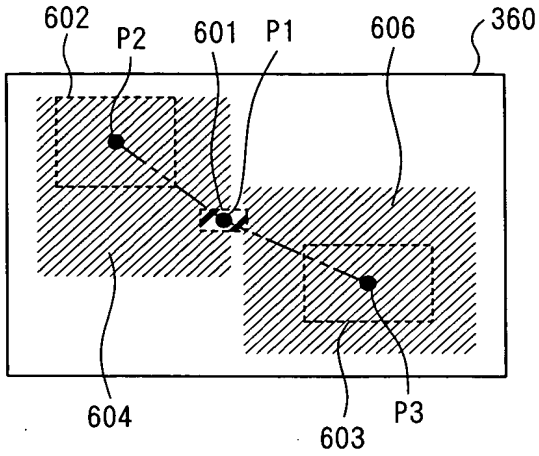


FIG. 33B

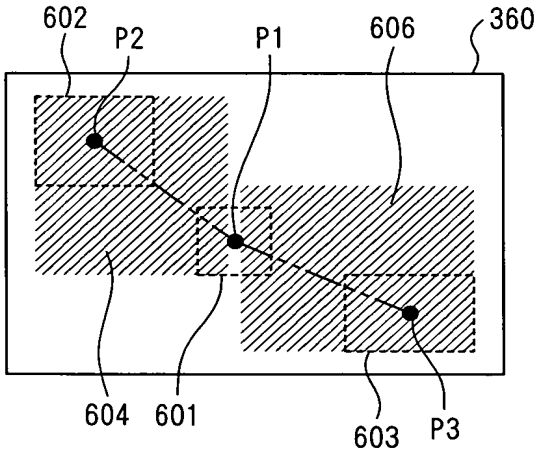


FIG. 33E

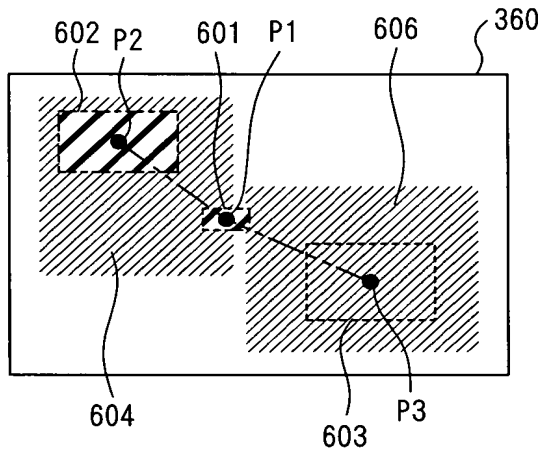


FIG. 33C

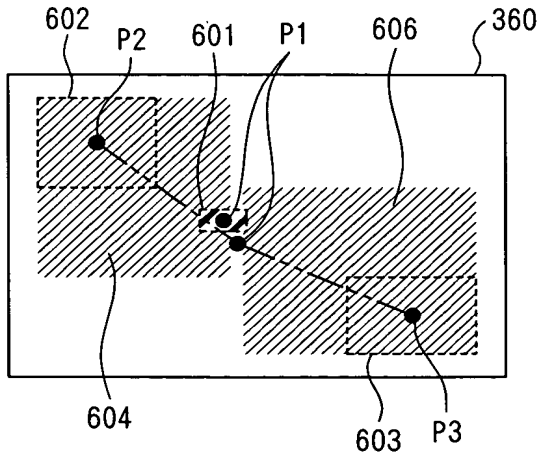
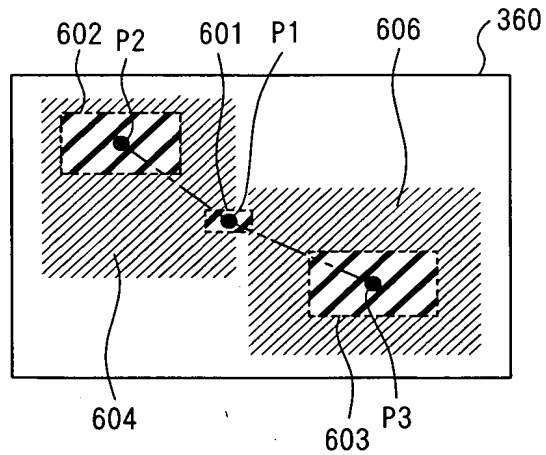



FIG. 33F